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Opioid Overdose Prevention and Naloxone Distribution in Rhode Island

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Introduction

Opioid overdose is a major public health concern that affects a diverse group of individuals across all categories of race, class, and geography.¹ Overdose is the leading cause of adult accidental death in Rhode Island, making our state one of only 16 where overdose mortality exceeds that of motor vehicle accidents.² Drug-related deaths, of which overdose is the largest component, claimed the lives of 193 Rhode Islanders in 2008.³

Opioid overdose (OD) occurs when opioids bind receptors in the brain stem, diminishing sensitivity to carbon dioxide and ultimately resulting in respiratory failure. Naloxone Hydrochloride (brand name Narcan[®]) is an opioid antagonist capable of reversing overdose due to opioids, such as heroin or prescription opioids.⁴ Naloxone has no potential for abuse; its only major contraindication, allergic reaction to prior administration, is rare.⁵ For more than three decades, emergency medical personnel have administered naloxone as a standard

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pre-hospital treatment for opioid overdose.⁴ Naloxone has been available, by prescription, to at-risk drug users and their family/friends since 1999 through select programs across the country.

A common argument against the provision of naloxone to at-risk **injection drug users (IDUs)** is that the availability of naloxone will increase their risk behavior. To the contrary, Seal *et al.* observed a decline in heroin use in participants enrolled in their naloxone (and resuscitation) intervention in San Francisco, with a simultaneous increase in overdose prevention knowledge.⁶

In two different studies of drug users in Rhode Island, the majority expressed a willingness to administer naloxone to a peer in the event of an overdose.⁷⁻⁸ Evaluations of naloxone interventions in major US cities, including San Francisco, Baltimore, Chicago, and New York, have found a notable increase in overdose knowledge among drug users trained in opioid OD recognition and response, dissemination of this knowledge through peer networks, and successful usage of naloxone by study participants.⁹

Massachusetts instituted a statewide pilot OD prevention program in late 2007, which is operated by the **Department of Public Health (DPH)**. The DPH purchases naloxone and distributes it to training centers, monitors the program, and tracks participant enrollment and naloxone use. The medical director has issued a standing order that allows non-medical personnel to distribute naloxone to trained lay responders in the community without a prescription. In Wilkes County, North Carolina, Project Lazarus began distributing naloxone through physicians in 2010, in collaboration with the state Medical Board. Naloxone is prescribed and distributed by physicians when patients with documented risk factors for overdose are prescribed opioid medications.

This paper presents an overview and pilot evaluation of **PONI (Preventing Overdose and Naloxone Intervention)**, the opioid overdose prevention program in Rhode Island.

Procedure and Methods

Preventing Overdose and Naloxone Intervention (PONI) is the pilot OD prevention program in Rhode Island. PONI has been conducted as a research study, approved by The Miriam Hospital's **Institutional Review Board (IRB)**. Recruitment occurred through a variety of venues, including a fixed-site needle exchange at Community Access (Broad St, Providence), outreach efforts conducted by AIDS Care Ocean State, drug abuse treatment centers, and homeless shelters.

The training process and curriculum are modeled after similar community overdose prevention programs. Participants are first guided through a detailed informed consent process by **research assistants (RAs)**, and then complete a short medical history. The medical history, which gathers information regarding past drug use and overdose(s), was the survey instrument through which data were gathered for this article. The RA then executes an interactive training process, including a discussion of common causes of OD, techniques for prevention, proper and improper responses, and administration of intramuscular naloxone. After completing a short quiz, the RA contacts Dr. Rich by phone and then distributes the prescribed naloxone. Participants are encouraged to return three months after the training or after the first use of naloxone, whichever comes first. Upon return, participants complete a report of naloxone use and are remunerated with a \$15 gift card.

Data were analyzed for descriptive statistics using STATA 11.0 (STATA Corp, College Station, TX).

Results

Since its inception in late 2006, 120 participants have been trained in overdose prevention and response through PONI and were included in this evaluation. All of these participants received a 10ml flip-top multiuse vial of naloxone, along with supplies to reverse at least three opioid overdoses, including printed materials with the overdose response steps. Table 1 displays demographic information gathered from study participants.

Currently, we have limited information on OD reversals by study participants, as a result of the passive reporting system and limited funding to collect follow-up data. Ten individuals returned for follow-up with PONI staff. Of these participants, five used their overdose response training and did not find it necessary to administer naloxone. In five cases, participants successfully administered intramuscular naloxone to reverse an opioid overdose. Reports from community agencies that hosted training events indicated that individuals have used naloxone to reverse opioid overdoses in the community, although they likely did not return for follow-up with PONI. Even with these limited data, PONI demonstrated that an OD prevention program with a naloxone distribution component is feasible in Rhode Island. Thus, there is a potential to greatly reduce overdose-associated morbidity and mortality in Rhode Island if this program is expanded.

In addition to the 120 individuals trained by PONI, over 1,000 inmates at the Adult Correctional Institutes have been trained in OD prevention, recognition, and response by PONI staff in collaboration with health educators at the Rhode Island Department of Corrections.

Limitations

The passive nature of PONI's reporting system limited the collection of participant follow-up data. Several factors may have contributed to the low follow-up rate. First, participants were issued sufficient supplies to reverse at least three overdoses before replenishing stocks with PONI staff. Second, it may be difficult for individuals trained in the greater Providence area to locate and travel to Community Access. Third, some members of the target population are transient, and may no longer be located in the area. Fourth, a significant percent of participants reported no lifetime opioid use and only 68% of participants had witnessed an OD. Therefore, it is possible that PONI did not exclusively train individuals with the greatest level of need or risk of overdose. Additionally, study participants may not report all overdose reversals. While gift card remuneration was offered for the three-month follow-up, cash remuneration could have improved follow-up rates. An effective mechanism to remind participants about the three-month follow-up is still needed.

Discussion

PONI is the first opioid overdose prevention program in Rhode Island. The program has met great success with the training of the first 120 participants, which has helped educate the citizens of Rhode Island and saved many lives. Similar opioid overdose programs currently exist throughout the nation that have been linked to measureable reductions in opioid-associated morbidity and mortality. Wide-scale, statewide efforts allow coordinated distribution of naloxone to large numbers of people and also provide the opportunity for more comprehensive monitoring of overdose events and responses by program participants.

The major challenge faced by PONI has been its limited size. When considering the scope of opioid use and misuse in Rhode Island, PONI has had limited reach. Expanding PONI would provide critical, lifesaving knowledge to opioid users and their friends and families, which could ultimately avert countless opioid overdoses and subsequent deaths.

A comprehensive approach to overdose prevention, including more efficient engagement of target populations, is required to address the burden of opioid overdose in Rhode Island. Regulatory changes, physician involvement and education, pharmacist involvement, potential funding strategies, legislative approaches, and collaborations with the Department of Health must all be considered to develop a state-wide strategy to address Rhode Island's opioid overdose epidemic. A system emulating that of Massachusetts may be plausible, where a standing order would be issued by the Department of Health to allow the distribution of naloxone without prescription by the project physician.

Physician and pharmacist involvement in overdose prevention will be a fundamental component of a comprehensive effort to address the overdose epidemic in Rhode Island. Continuing education could be offered to educate providers and pharmacists about the severity of the overdose epidemic in our state, risk factors for overdose, and potential ways to intervene, including the safe and appropriate prescription of opioids. Pharmacists can check dosing levels and interactions of prescribed opioids. The new statewide **prescription monitoring program (PMP)** database will soon permit real-time queries of patient's controlled substances prescription fill records. Registered physicians and pharmacists could then utilize the PMP to detect "doctor shopping" and unusual doses of narcotics, and better inform patient-provider discussions about long-term treatment with opioid medications.

A naloxone kit distributed by PONI costs about \$15 and has the potential to reverse a total of five overdose events. In 2008, a conservative estimate for the cost of treating OD events in Rhode Island's emergency departments (327 visits) is \$88,288, with an additional minimum of \$827,637 spent on hospital admissions related to OD events. This produces a total of \$915,925 in OD-related hospital costs for 2008, which could have purchased over 61,000 kits of naloxone.^{10,11,12}

Conclusions

A statewide OD prevention strategy in Rhode Island must take a unique approach to meet the needs of the state with limited resources. Integrating multiple elements from other large-scale programs, in addition to innovative ideas for overdose prevention and response, would likely be the most successful and realistic option for Rhode Island. An ideal program would encourage physicians to prescribe naloxone in a proactive manner to appropriate at-risk patients, encourage the involvement of pharmacists and state policy makers, and allow community agencies to maintain OD prevention training and naloxone distribution programs with minimal programmatic support from the Department of Health. Collectively, these components could allow for widespread distribution of naloxone and OD prevention knowledge and skills to residents, ultimately reducing opioid overdose-associated mortality and morbidity in Rhode Island.

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Table 1

Participant Demographics, Opioid Use and Overdose History

DEMOGRAPHICS (N=120)			
Age	Mean = 38	Standard Deviation=12.5	
	Median = 38	1st Quartile: 29	
		3rd Quartile: 47	
Characteristic		number	percent
Gender	Male	63	53
	Female	56	46
	Declined	1	1
Race/Ethnicity	Caucasian/White	65	54
	Black/African American	14	12
	Hispanic/Latino(a)	22	18
	Other	16	13
	did not identify	3	2
OPIOID USE			
	Lifetime use	78	65
	No Lifetime use	42	35
OD HISTORY			
Have ever OD'd			
(including non-opioid)		41	34
Witnessed an OD	Yes	81	68
	No	38	31
	No response	1	1